Yue Xin

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SUMMARY

Top 5% in Grades; National Scholarship; Mathematics and Physics competitions; First author at top conferences; Has received offers from some quantitative companies

Solid mathematical and theoretical background; 3 years of research experience; 5 years of programming experience

EDUCATION

Shanghai Jiao Tong University (SJTU) **June 2023 – Present**

M.S. in Information and Communication Engineering *Shanghai, China*

- Adversor: Prof. Hongkai Xiong and Prof. Wenrui Dai

Shanghai Jiao Tong University (SJTU) **Sep 2019 – June 2023**

B.S. in Electronic Science and Technology (major) and Computer Science and Technology (minor) *Shanghai, China*

- Upon graduation (all courses): Grades: 89.66/100 GPA: 3.85/4.3 Ranking: 4/56
  When receiving the National Scholarship (all courses): Grades: 90.10/100 GPA: 3.89/4.3 Ranking: 2/64
- A(90+) for all math/physics related courses(Calculus, Physics, Probability and Statistics, etc) and most major related courses(Signals and Systems, Progamming, Digital Image Processing, etc). A+(95+) for most major related experimental courses(Engineering Problem Modeling and Simulation, Engineering Practice and Technological Innovation).

PUBLICATIONS

- **Clarifying the Behavior and the Difficulty of Adversarial Training**
  Xu Cheng*, Hao Zhang*, **Yue Xin**, Wen Shen, Jie Ren, Quanshi Zhang.
  AAAI 2024 accepted. [paper]

- **Towards the Dynamics of a DNN Learning Symbolic Interactions**
  Qihan Ren, Yang Xu, Junpeng Zhang, **Yue Xin**, Dongrui Liu, Quanshi Zhang
  NeurIPS 2024 accepted [paper]

- **ChebyNet: Boosting Neural Network Fitting and Efficiency through Chebyshev Polynomial Layer Connections**
  Yue Xin, Jiarui Zhang, Ziyang Zheng, Yaoming Wang, Wenrui Dai, Chenglin Li, Junni Zou, Hongkai Xiong.
  ICLR 2025 on submission [paper]

- **Decoding the Secrets of Chain-of-Thought in Large Language Models: A Shapley Value Perspective on Mathematical Reasoning**
  Yue Xin, Chen Shen, Shaotian Yan, Xiaosong Yuan, Jieping Ye.
  NAACL 2025 on submission

- **GLEAM: Global Share Local Transform MoE for Downstream Transferring With Enhanced Parameter Efficiency**
  Jiarui Zhang, **Yue Xin**, Yaoming Wang, Ziyang Zheng, Wenrui Dai, Chenglin Li, Junni Zou, Hongkai Xiong.
  AAAI 2025 on submission

ACADEMIC RESEARCH EXPERIENCE

Institute of Media, Information and Network(min), SJTU **Nov 2022 – Present**

Machine Learning and Computer Vision Intern and Master's Student *Advisor: Hongkai Xiong, Wenrui Dai*

- Proposed ChebyNet, a novel network paradigm to build Chebyshev polynomial connections between general network layers. Specifically, established recursive relationship among adjacent layers and polynomial relationship between non-adjacent layers. Comprehensive experiments vefify its strong approximation capability. (ICLR 2025 on submission)
- Proposed GLEAM, an efficient fine-tuning method for large model parameters. This method leverages the high similarity of parameter matrices in LoRa to construct a low-rank decomposition, further reducing the number of parameters required for fine-tuning while enhancing performance. (AAAI 2025 on submission)

Feitian Lab, Alibaba Cloud **Mar 2024 – Present**

Interpretable LLM Research Intern *Advisor: Jieping Ye*

- Proposed a new paradigm that calculates the importance of different components of few-shot CoT demonstrations using Shapley values, thereby enhancing the inference capability of large models. This approach elucidates the mechanism of CoT in large models and unifies previous research. (NAACL 2025 on submission)

Interpretable ML lab, SJTU **Feb 2022 – Nov 2022**

Interpretable Machine Learning Intern *Advisor: Quanshi Zhang*

- Theoretically derived the analytical solution for multi-step adversarial attacks, which explains the reasons behind the optimization difficulties in adversarial training. This is validated through experimental results. (Accepted by AAAI 2024)
- Theoretically derived the two-stage dynamic interaction process of DNNs, proving that the network learning process gradually encodes interactions of varying complexity. This provides a theoretical foundation for understanding overfitting. (Accepted by NeurIPS 2024)
- Theoretically derived and validated the robustness of concepts with different complexities.

SunnyLab, SJTU **Mar 2021 – May 2022**

Machine Learning and Computer Vision Intern *Advisor: Chongyang Zhang*

- Developped Swin Transformer based model to implemente instance segmentation of workpiece welding area.
- Designed a space-time filter to remove false positive samples in pedestrian detection.
- Developped YOLOv5-based model to detect tower crane, recognize dangerous tower crane, and label electronic fence.

ACADEMIC COMPETITION (Selected)

The 20th Chinese Graduate Mathematical Modeling Competition: ***Nation level, Second Prize*** **2023**

The Mathematical Contest in Modeling: ***World level, Meritorious Winner (First Prize)*** **2021**

The Huawei Cloud 'Cloud Pioneers' Few-Shot Detection Competition: ***Nation level, Third Place*** **2021**

The 12th National College Student Mathematical Competition: ***City level, First Prize*** **2020**

The 2nd National 'August 1st Cup' Online Mathematics Competition: ***Nation level, Tenth Place*** **2020**

Chinese Physics Olympiad: ***Province level, First Prize*** **2018**

PROJECT (Selected)

CS368: Digital Image Processing Course Final Project | *Python, Pytorch* **Oct 2021 – Feb 2022**

Implemented multi-object tracking and behavior recognition for soccer players using algorithms like ByteTrack, YOLOv5, and Kalman filtering, with file Transfer and visualized recognition results using Qt.

AI005: Deep Learning Practical on Huawei AI Platform Competition | *Python, Pytorch* **Oct 2021 – Feb 2022**

Secured the third place nationwide in the 'Cloud Pioneers' competition on Huawei Cloud by successfully completing the few-shot detection task.

EE458: Software Engineering Course Final Project | *Python, Pytorch, Java* **Sep 2021 – Jau 2022**

Trained a YOLOv5 model on a face mask dataset and deployed it on mobile devices for real-time mask detection.

TECHNICAL SKILLS

Programming Languages: Proficient in Python, C++, Matlab, LaTeX, Linux, etc.

Frameworks: Proficient in PyTorch, NumPy, Anaconda, Git, OpenCV.

Mathematics: Proficient in calculus, linear algebra, probability statistics, etc.

Language: mandarin (native), English (fluent)

HONORS & AWARDS (Selected)

Outstanding Undergraduate Graduate of Shanghai Jiao Tong University ***University level, 5%*** **2023**

National Scholarship ***Nation level, 2%*** **2021**

Shanghai Jiao Tong University A-Class Excellent Scholarship for Undergraduate ***University level, 2%*** **2021**

Shenzhen Stock Exchange Scholarship ***University level, 2%*** **2020**

Shanghai Jiao Tong University B-Class Excellent Scholarship for Undergraduate ***University level, 5%*** **2020**

EXTRACURRICULAR ACTIVITIES (Selected)

Head Coach of College Table Tennis Team and Club **Sep 2021 – Present**
SJTU *Zhiyuan College*

Member of School Table Tennis Team **Sep 2019 – Present**
SJTU

Captain of College Table Tennis Team **Sep 2021 – Dec 2023**
SJTU *School of Electronic Information and Electrical Engineering*

- Third Place in the Team Category at the Tizong Cup in 2021
- Second Place in the Team Category at the School Sports Meet in 2022

Member of School Track and Field Team **Sep 2020 – May 2021**
SJTU

- Second Place in the Men's 4×100-Meter Relay at the School Sports Meet in 2020
- First Place in the Men's 4×100-Meter Relay at the 2021 Track and Field Athletics Meet

Counselor of Physics Subject Camp **Sep 2020 – Jau 2021**
SJTU